Phase 2 Background Report
Economic and Fiscal Conditions

Property Value Analysis Using
A Hedonic Property-Pricing Model

Study Plans R-18 and R-19
Oroville Facilities Relicensing

DRAFT

Prepared for:

Recreation and Socioeconomics Work Group

Developed by:

Harza/EDAW Team
100 Howe Avenue, Suite 210 South
Sacramento, California 95825

and

California Department of Water Resources
Division of Environmental Services

January 2004

Executive Summary

INTRODUCTION

The purpose of this study is to evaluate the relationship between the Oroville Facilities and local property values. Two types of relationships are evaluated: (1) the relationship between proximity (or distance) to Lake Oroville and property values; and (2) the relationship between lake levels at Lake Oroville and property values. This information was requested as an element of Study Plans R-18 and R-19 by the Recreation and Socioeconomics Work Group for the Oroville Facilities Relicensing.

METHODOLOGY

The study relies on a hedonic property-pricing model to evaluate the relationship between the Oroville Facilities and local property values. The model is represented by a multiple linear regression equation, which is used to isolate and quantify the factors that affect the value of housing stock in the study area.

The study area is defined as those communities whose property values are potentially affected by the Oroville Facilities. This "area of influence" was identified through a survey of local realtors, and includes the communities of Berry Creek, Concow, Feather Falls, Forbestown, Oroville, Palermo, and Paradise.

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

ES-1

January 29, 2004
Phase 2 Background Report:
Property Value Analysis

Information needed to develop a hedonic property-pricing model includes data on housing sales and characteristics, which were obtained from *CD-DATA*, a private company that tracks county assessor data. Other pertinent data used in this study include spatial information on the location of properties in the study area and lake elevation levels.

The final dataset used to develop the model was derived from a larger sample of observations in the study area. A filtering process was employed to ensure that the data used in this study fits the context of the study and represents the best available information. Based on the filtering process described above, the final sample size for this study totals 5,379 observations (i.e., record of sales between 1991 and 2002).

The model developed for the study is represented by a dependent variable (i.e., sales price of property) and a set of independent variables, which are intended to reflect those factors that influence the variability in the sales price of property. Independent variables in a hedonic property-pricing model are commonly organized into structural, neighborhood/economic, and environmental/amenity variables. For this study, a wide range of potential independent variables were considered and tested for inclusion in the model.

Modeling Results

The modeling results reflect the best-fitting model for explaining the relationship between local property values and the Oroville Facilities. The best-fitting model is linear in its functional form (with selective independent variables in non-linear form). The

Oroville Facilities Relicensing   ES-2   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report:
Study Plans No. R18 and R19   Property Value Analysis

dependent variable in the model is sales price adjusted to 2002 dollars using the CPI index for California. The independent variables include: square footage of home, size of lot (in acres), a dummy variable for homes that have a built-in swimming pool, the general quality of the main structure as determined by the County Assessor (measured on a scale from 1 to 10), age of the home at the time of the sale, a set of neighborhood variables that identify the community where the property is located, national average contract mortgage rate index for the month of sale, properties that were sold in the months April through August (high demand period), a trend variable represented by the year the home was sold (measured from year 1 to year 12), distance to Lake Oroville as measured from the center of the property to the edge of the lake at full pool (measured in meters), and the average monthly lake level at Lake Oroville for the preceding 3-month period relative to the date the property was sold (measured in feet above mean sea level).

The selection of a preferred model for this study was based primarily on criteria that gauge the robustness of regression-based models. These criteria include adjusted R-square, which measures the overall "fit" of the model, and p-values, which measure the confidence level at which the coefficient estimate can be interpreted. The adjusted R-square for the preferred model indicates that about 78 percent of the variability in adjusted sales price is explained by the sixteen explanatory variables and the constant value (intercept).

Several modeling issues also were considered in estimating the hedonic property-pricing model for this study, including heteroscedasticity, limited range of housing choices, and market segmentation. Only heteroscedasticity was identified as an issue

for modeling purposes. Due to the presence of heteroscedasticity in the model, the regression results were corrected by using White's heteroscedastic-consistent covariance matrix.

The coefficient estimates for the structural variables included in the model are all intuitively plausible and statistically significant at the 10 percent significance level. As expected, there is a positive relationship between most physical characteristics of the structure (i.e., square footage, lot size, presence of a pool, and quality rating), except for the age of the structure at the time of the sale, which has a negative relationship with property values.

The neighborhood variables in the model indicate the relative difference in property values between Oroville and other affected communities. Most of the neighborhood variables, except Feather Falls, are statistically significant. On average, properties located in the communities of Paradise, Forbestown, and Palermo have higher values than properties located in Oroville, holding all else constant. The other communities in the study area, including Concow, Berry Creek, and Feather Falls, have lower property values relative to properties located in Oroville.

The two economic-based variables in the model, interest rates and seasonal demand during the months of April through August, demonstrate a negative and positive relationship, respectively, with property values. Each of these variables is statistically significant. The trend variable in the model, which is represented by the year the home was sold, is positive and statistically significant. In other words, home prices have

trended upward between 1991 and 2002, after accounting for inflation (by adjusting sales prices by the CPI Index) and holding all else constant.

The final two variables in the model, which are the key variables of interest for the study and represent the amenity-based characteristics of properties in the study area, are distance to Lake Oroville and lake levels associated with the time of the property sale. As expected, there is a negative and statistically significant relationship between distance to Lake Oroville and property values. In other words, as the distance between a property and Lake Oroville increases, the lower the property value will be, holding all else constant. Conversely, properties that are located closer to the lake are valued higher, on average, than those properties located further away.

The result for the other key variable of interest, lake levels at Lake Oroville, is not intuitively plausible. This variable is defined as the average monthly lake level over the preceding three months from the date of the sale, and is intended to represent average lake-level conditions during the home-buying process. The coefficient estimate for this variable is negative and statistically significant. This implies that lower average lake levels near the time of sale are expected to result in higher property values, holding all else constant. This is counter-intuitive to the expectation that higher lake-levels would positively influence property values based on more accessibility to lake-level dependent recreation facilities and the aesthetic value of a fuller reservoir. However, when evaluated in the context of properties that potentially have views of the reservoir, this relationship remains negative but is no longer statistically significant.

CONCLUSION

The purpose of this study was to evaluate the relationship between the Oroville Facilities and local property values. The results of the analysis show that distance to Lake Oroville helps explain local property values, with properties closer to the lake being valued higher, holding all other things constant. The results also show that lower lake levels tend to result in higher property values, a finding that is not intuitively plausible based on expectations that higher lake levels provide aesthetic benefits and allow for more access and use of recreation facilities such as boat ramps. This relationship, however, is not statistically significant for properties that potentially have views of the lake.

Table of Contents

Oroville Facilities Relicensing   i   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

Tables and Figures

Acronyms

GIS	geographic information system
DWR	California Department of Water Resources
CDEC	California Data Exchange Center
CPI	Consumer Price Index
TRT	Technical Review Team

Oroville Facilities Relicensing   ii   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

1.0 INTRODUCTION

This study is being conducted to better understand the role that development of the Oroville Facilities has had on local property values. The topic was initially addressed in Phase 1 of the Background Report for Study Plans R18 (Recreation Activity, Spending, and Associated Economic Impacts) and R19 (Fiscal Impacts) where historical trends in assessed property values in the region were presented and evaluated. This study takes the issue one step further by quantifying the factors, including operations of the Oroville Facilities, that influence recent property values in the Oroville area. Although not required by FERC, information pertaining to the relationship between property values and lake levels can be considered when evaluating alternative future operational scenarios of the Oroville Facilities under the relicensing process.

The primary purpose of the study is to evaluate the relationship between the Oroville Facilities and local property values. Two types of relationships concerning Oroville Facilities and local property values are evaluated: (1) the relationship between proximity (or distance) to Lake Oroville and property values; and (2) the relationship between lake levels at Lake Oroville and property values. Linear regression techniques are used to evaluate these and other factors that affect the value of housing stock in the local housing market.

This report describes the theoretical background of the hedonic property-pricing model, describes the methodology used in developing the hedonic property-pricing model for

Oroville Facilities Relicensing   1   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

the study, presents and interprets the results of the hedonic property-pricing analysis,

and provides concluding thoughts on the study results.

2.0 THEORETICAL BASIS OF THE HEDONIC PROPERTY-PRICING MODEL

Different methodologies are available to derive the value of non-marketed goods, such as environmental and recreational amenities. This study utilizes the hedonic property-pricing model to analyze the relationships between the Oroville Facilities and property values. The hedonic property-pricing model estimates the value of specific property characteristics (e.g., square footage, number of rooms) by tracking the change in the sales price of properties with respect to varying levels of these characteristics. This model can be used to derive the marginal implicit prices of housing characteristics, which are defined as the marginal increase in property values that results from a one unit increase in that particular property characteristic, holding all else constant. Additional information on the theoretical basis of the hedonic property-pricing model is included in Appendix A.

3.0 METHODOLOGY

The methodology used to develop and implement the hedonic property-pricing model for this study consisted of the following three basic tasks: (1) define the study area; (2) develop the study dataset; and (3) estimate the model.

3.1 Study Area

The study area is defined as those communities whose property values are potentially affected by the Oroville Facilities. This "area of influence" was identified through a survey of local realtors (see Appendix B). The survey was designed to elicit general information concerning realtors' perceptions of the relationship between Lake Oroville and local residential property values, but focused on having the realtors identify which communities[1] (or real estate markets) in Butte County are influenced by the Oroville Facilities. In total, 16 realtors in the Oroville and Paradise areas were interviewed; the results of the survey also are provided in Appendix B. Based on input from the Socioeconomics Technical Review Team (TRT), it was concluded that communities that were identified by at least half (8 or more) of the realtors surveyed were considered appropriate for defining the study area. These communities include:

- Berry Creek

- Concow

- Feather Falls

- Forbestown

_____

[1] All Butte County communities listed in the County Assessors' records were included in the realtor survey – See Appendix B.

Oroville Facilities Relicensing   4   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

- Oroville

- Palermo

- Paradise

3.2 Study Dataset

Developing the dataset for the study involved obtaining data on sales and other property attributes and carefully reviewing ("cleaning") the dataset to ensure consistent and complete data for the analysis.

3.2.1 Data Sources

Data for the analysis were obtained from CD-DATA through its *ParcelQuest* service for Butte County. *ParcelQuest* is a database containing comprehensive assessor information for properties. In addition to providing data on a range of structural characteristics, this database also provides data on sales prices of properties based on transfer tax information. Because the *ParcelQuest* data are derived directly from county assessor information, which represents a comprehensive and updated record of the characteristics and sales of all properties within a particular jurisdiction, it is considered the best available information for use in this study. The *ParcelQuest* data contains sales transaction data dating back to the mid-1980s.

Other data required for this study include spatial information on the location of properties in the study area and lake elevation levels. The spatial data considered in this study are based on the GIS parcel map for Butte County, which was obtained from DWR. GIS

Oroville Facilities Relicensing   5   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

applications were used to generate a range of spatial variables that were considered for inclusion in the model, including proximity variables that measured the distance of properties sold to the Oroville Facilities (i.e., Lake Oroville, Thermalito Forebay and Afterbay). Lake elevation information was obtained from the California Data Exchange Center (CDEC), which tracks historical reservoir elevation data throughout the State. These data were used to develop a set of lake-level variables that associate properties sold with corresponding lake-level conditions.

3.2.2 Construction and Review of the Dataset

To estimate the hedonic property-pricing model, a comprehensive dataset was developed that included all of the properties sold in the study area between 1991 and 2002 and a range of explanatory variables that would be considered in developing the model. Development of the dependent variable and independent (explanatory) variables for the model is described below.

3.2.2.1 Dependent Variable

The dependent variable in the hedonic property-pricing model represents the value of properties sold. The standard proxy for value in hedonic studies is the market sales price. Sales price is typically preferred over other alternatives, such as assessed value, because it is based on market conditions and is not subjectively calculated. As indicated above, sales price information was obtained from the *ParcelQuest* database and is based on transfer tax information from the county assessor's records. Because

Oroville Facilities Relicensing   6   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

the dataset contains property transactions that cover a 12 year timeframe, all sales price data were adjusted to 2002 dollars using a consumer price index (CPI) for California.

3.2.2.2 Independent (Explanatory) Variables

The remaining variables in the dataset represent potential independent (or explanatory) variables. In selecting the independent variables in a hedonic property-pricing study, all factors that influence the value of a property should be considered. Independent variables in a hedonic property-pricing model are commonly organized into structural, neighborhood/economic, and environmental/amenity variables. Issues that should be considered when selecting a set of independent variables include the effects of excluding relevant variables (i.e., omitted variable bias), correlation among variables (i.e., multicollinearity), correct specification of the variables, and controlling for variables that are correlated with the key variables of interest.

Variables that were considered for inclusion in the model were based, in part, on data available through *ParcelQuest*[2] (see Appendix C), and on the availability and/or feasibility of generating other pertinent data. The final dataset included the following independent variables for evaluation:

_____

[2] Not all data fields listed in the ParcelQuest database are available for Butte County.

Oroville Facilities Relicensing   7   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

- **Structural Variables**
  - Number of bathrooms
  - Number of bedrooms
  - Size of structure
  - Fireplace
  - Lot size
  - Pool
  - Quality of building/structure
  - Age of structure
  - Air conditioning
  - Central heating
  - Parking type (carport)

- **Neighborhood / Economic Variables**
  - Year (trend variable)
  - Neighborhood location
  - Unemployment rate
  - Interest rate
  - Dow Jones Industrial Average
  - Housing price indices for the San Francisco Bay Area
  - Seasonal demand for housing
  - Other economic or social trends

- **Environmental / Amenity Variables**
  - Distance to Lake Oroville
  - Distance to Thermalito Forebay or Afterbay
  - Distance to City of Chico
  - View of Lake Oroville (based on coordination with local realtors that identified roadways that may potentially provide views of the reservoir)
  - Lake level at Lake Oroville (numerous lake level definitions were tested)
    - average monthly lake-level for the month of sale;

Oroville Facilities Relicensing   8   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

- average monthly lake-level at a three month lag of the date of the
  sale;
- average monthly lake-levels for 3 months preceding the sale date;
- average monthly lake levels for 12 months preceding the sale date;
- minimum average monthly lake level during summer (May – Sep);
- minimum average monthly lake level during summer (May – Sep)
  expressed as a percentage of average summer monthly minimum
  lake levels over the study period; and
- lake levels that exceeded the 750-foot (above sea level) threshold at
  a 3-month lag of the date of sale (intended to represent facility
  usability)

3.2.2.3 Filtering Process

The final dataset for this study was derived from a larger potential sample of

observations in the study area. The number of recorded sales in the initial dataset

included 16,171 observations, representing properties in the study area that have

recorded sales information (including sales price). A filtering process was employed to

ensure that the data used in this study fits the context of the study and represents the

best available information. Filters that were used in refining the number of observations

to the final dataset include:

- *Single-Family Residential Properties:* This filter removed all observations
  that are not characterized by single-family residential properties.
  Analyzing only single-family residential properties allows for consistency
  within the final dataset.

- *Transaction Type:* This filter removed all transactions that are not considered "full" sales. Full sales are transactions that represent the full value of the property, and therefore, are the most appropriate type of sale to include. Other types of transactions might imply that an "arms-length" sale took place.

- *Joint Sales:* This filter removed observations that appear to be part of joint sales. For example, vacant lots frequently are sold jointly with neighboring developed properties (homes) owned by the same person. The problem is that these joint sales have the same sales price listed for each component of the sale, and as a result, the listed prices do not represent the true value of each *individual* property.

- *Missing Data:* This filter removed those observations with missing data entries. These observations cannot be used because the estimation process requires that all observations have values corresponding to the variables that are included in the model.

- *Outliers:* The potential sample set was screened for outliers in both the dependent variable (i.e., sales price) and independent variables. The procedure used to screen for outliers was to compare individual values for the various variables in relation to the mean, median, and standard error values for the entire dataset, as well as natural breaks in the data. Specifically, variables were screened using the following criteria:

-   Bathrooms: excluded observations with *8* or more total bathrooms;

-   Bedrooms: excluded observations with *10* or more bedrooms;

-   Size of structure: excluded observations that have less than *320* square feet;

-   Age/Year built: excluded observations that were constructed prior to the year *1900*;

-   Lot size: excluded observations that are less than *0.03 acres* or greater than *70 acres* in size;

-   Adjusted sales price: excluded observations with an adjusted sales price less than $25,000; and

-   Adjusted price per square foot: excluded observations with adjusted price per square foot that was less than $30/sq.ft and greater than $141/sq.ft).

- *Parcel Map:* The final filter applied to the potential sample set was to remove all observations that were not mapped or represented by split parcels on the Butte County GIS parcel map. All observations have to be identified on the parcel map in order to implement the GIS applications required for this study

Based on the filtering process described above, the sample for the analysis totals 5,379 observations. Of these, 2,816 properties are located in Paradise, 2,216 in Oroville, 114 in Palermo, 113 in Berry Creek, 88 in Concow, 26 in Forbestown, and 6 in Feather Falls (Figure 1).
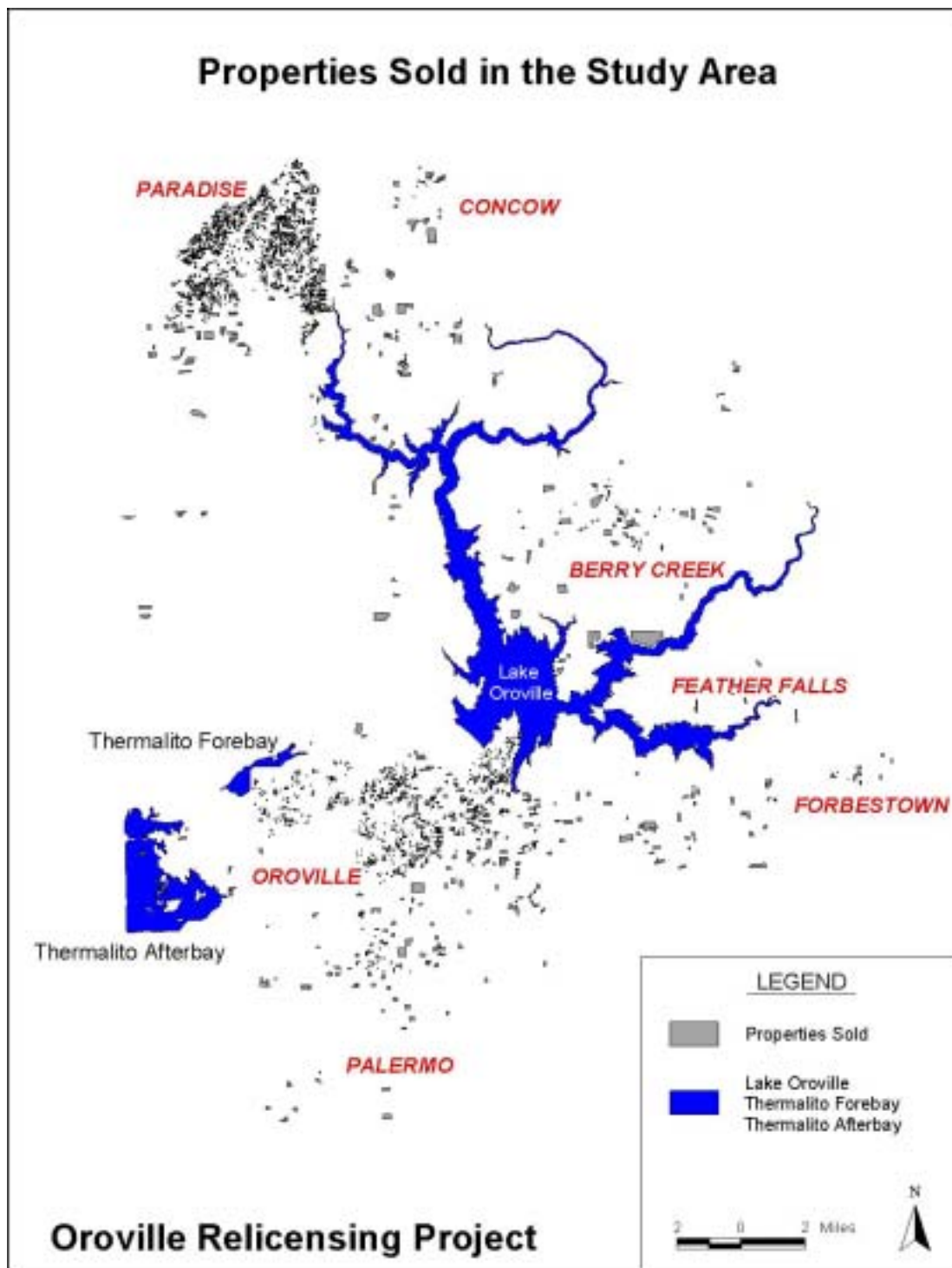
Figure 1. Property Value Study Area

Oroville Facilities Relicensing   12   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

3.3 Model Estimation

Estimation of the hedonic property-pricing model is conceptually straightforward. A dependent variable representing the value of a property is regressed on all of the characteristics (independent variables) that have the potential to influence its value. However, identifying the appropriate independent variables to include in the final model involves extensive testing of various model specifications that are characterized by multiple definitions and combinations of variables and functional forms.

3.3.1 Functional Form

Functional form is an important consideration in estimating all regression models, including the hedonic property-pricing equation. The goal in selecting the functional form of a model is to represent the true relationships between variables in the data. Economic theory is generally used as a starting point in defining functional form. Applying incorrect functional forms in a model could result in misinterpretation of modeling results.

Hedonic models typically take the form of a linear regression equation, which means that they are linear in their parameters, but not necessarily linear in the dependent and explanatory variables. The selection of functional form for the model variables must consider several issues, including the manner in which the dependent and independent variables enter the hedonic price equation. Simple scalar and/or logarithmic measures are commonly used. Variables should be defined such that they capture the amenity levels *perceived* by purchasers, which often offers guidance on how they should be

represented in the model. For example, distance variables (e.g., distance of the property from the Oroville Facilities) are inherently non-linear because the value generated by this particular amenity should approach zero, and not become negative, as the measure of distance increases. There is no preferred approach to specifying functional form, with a wide range of functional forms having been used in the economics literature. For this study, the linear, linear-log, log-linear, and log-log functional forms were evaluated to determine which one represents the best-fitting model, and thus would provide the most robust model results. .

3.3.2 Identifying a Preferred Model

The selection of a preferred hedonic property-pricing model was based on consideration of criteria that gauge the robustness of regression-based models, including:

- **Adjusted R-Square**. Adjusted R-square measures the proportion of the variation in the dependent variable (e.g., sales price) accounted for by the explanatory variables in a regression model, or in other words, the overall "fit" of the model. For example, an adjusted R-squared of 0.75 means that the explanatory variables in a regression model explain 75 percent of the variability in the dependent variable. Models with higher adjusted R-square values are preferred over those with lower values because they represent better-fitting models upon which more statistically reliable interpretations and conclusions can be drawn.

- **P-Values**. In the context of hypotheses testing, a p-value is defined as the probability of getting a value of the test statistic as extreme as, or more extreme than, that observed by chance alone if the null hypothesis is true. More simply, p-values measure the confidence-level at which the coefficient estimate can be interpreted. For example, a p-value of 0.10 means that the coefficient estimate is statistically significant at the 90 percent confidence level (1 - p-value). A p-value threshold of 0.1 or lower (90 percent confidence level or higher) was adopted for this study. In other words, all explanatory variables must be statistically significant at the 90 percent confidence level for inclusion in the model (note: there is an exception to this rule in the preferred model, which is explained in the model results presented in Section 4.0).

In addition, other criteria were considered during the testing of alternative model specifications. Variables that introduce multicollinearity among independent variables were excluded, with a correlation threshold of 0.8 used to determine multicollinearity. In addition, independent variables that were unstable (i.e., coefficient estimates that switch signs under different model specifications) were excluded from the model.

The best-fitting model for explaining the relationship between property values and the Oroville Facilities had the following characteristics:

- **Functional Form:** Linear (with selective independent variables in non-linear form)

- **Dependent Variable:**
    - *ADJ-PRICE:* Sales price adjusted to 2002 dollars using the CPI index for California.

- **Independent Variables:**
  - *SQFT:* Square footage of home (in square feet).

  - *LOT_SIZE:* Size of lot (in acres). Obtained through GIS parcel base.

  - *POOL_DV:* Homes that have a built-in swimming pool (dummy variable).

  - *QUALITY:* The general quality of the main structure, as determined by the County Assessor (ranges from 1 to 10).

  - *AGE_SALE:* The age of the home at the time of the sale.

  - *ORO / PARADISE / FORB / CONCOW / PALERMO / BRYCRK / FTHFALLS:* Neighborhood variables that identify the community where the property is located; namely, Oroville, Paradise, Forbestown, Concow, Palermo, Berry Creek, and Feather Falls (dummy variables). These variables take into account a number of factors that may vary across communities, in particular demographics (e.g., race, crime, etc.) and other urban features (e.g., shopping/entertainment opportunities, employment conditions, etc.). The variable *ORO* (i.e., properties located in the City of Oroville) is omitted from model regression equation to show the relative price difference in the other communities compared to the community of Oroville. However, this does not mean that Oroville properties are excluded from the model; instead, one of the neighborhood variables must be omitted to avoid perfect multicollinearity with the constant term, and as a result, it serves as the control group against which the remaining variables are compared.

  - *INT_RATE:* National average contract mortgage rate index for month of sale.

Oroville Facilities Relicensing   16   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

o *APR-AUG:* Properties that were sold in the months April through August (dummy variable). Used to control for periods of peak demand in the housing market.

o *YEAR:* Year the home was sold (ranges from year 1 to year 12).

o *DIST_ORO (Log):* The natural log of distance to Lake Oroville, as measured from the center of the property to the edge of the lake at full pool (in meters).

o *LAKE_3AVE:* The average monthly lake level at Lake Oroville for the preceding 3-month period relative to the date the property was sold (in feet above mean sea level). The 3-month lag period is based on the assumption that it takes roughly 3 months from the time a prospective homebuyer decides to purchase the property until escrow closes and the sale is officially recorded.

4.0 MODEL RESULTS

4.1 Preferred Model

The best-fitting model for explaining property values in the Oroville area is summarized in Table 1. The model consists of a regression equation that provides coefficient estimates for the independent (explanatory) variables and a constant (intercept) term. The coefficient estimates demonstrate the magnitude of the relationship between the dependent and independent variables. Each of the coefficient estimates has an associated t-statistic (and corresponding p-value), which denotes the statistical significance of the coefficient associated with that particular independent variable. Generally, t-values greater than 1.65 indicate that the coefficient for a particular variable is statistically significant (i.e., different from zero) at the 90 percent confidence level. It should be noted that the model results provided below indicate the magnitude and statistical significance of the coefficient estimates, which are based on an estimated relationship between the explanatory variables and sales price; this does not necessarily imply a causal relationship between variables.

Table 1: Regression results - Preferred model

Variable	Estimated Coefficient	T-Statistic [1]	P-Value [1]	Marginal Implicit Price
Constant	97679.784	7.258	.000	--
Structural Variables				
SQFT	66.052	27.846	.000	$66 / sq. ft.
LOT_SIZE	1516.863	5.303	.000	$1,517 / acre
POOL_DV	7807.410	2.339	.019	$7,807
QUALITY	17982.668	19.201	.000	$17,983
AGE_SALE	-322.150	-10.610	.000	-$322 / year
Neighborhood / Economic Variables				
PARADISE	24460.693	27.965	.000	$24,461
FORB	23652.494	4.291	.000	$23,652
CONCOW	-18520.342	-4.406	.000	-$18,520
PALERMO	9950.052	2.443	.015	$9,950
BRYCRK	-11634.629	-3.138	.002	-$11,635
FTHFALLS	-22823.896	-1.528	.127	-$22,824
INT_RATE	-5809.654	-6.357	.000	-$5,810 / pct.
APR-AUG	9614.303	9.718	.000	$9,614
YEAR	307.118	1.750	.080	$307 / year
Environmental / Amenity Variables				
DIST_ORO (Log)	-4497.354	-6.622	.000	-$44.97 / mtr.
LAKE_3AVE	-125.561	-13.351	.000	-$126 / ft.
R^2 Adj. R^2 F-Statistic	0.783 0.782 1207.9			

[1]Denotes that all estimates have been corrected for heteroscedasticity using White's heteroscedasticity-consistent covariance matrix.

The F-Statistic, which explains the overall significance of the model, is 1207.9, and is statistically significant at the one percent significance level (p-value=0.000). Therefore, it can be concluded that this set of explanatory variables does in fact explain variation in the dependent variable (adjusted sales price of residential properties in the Oroville

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

19

January 29, 2004
Phase 2 Background Report
Property Value Analysis

area). The adjusted R-squared, which denotes how well the overall model fits the data, is 0.78 and indicates that roughly 78 percent of the variability in adjusted sales price is explained by the sixteen explanatory variables and the constant value (intercept).

All coefficient estimates for the structural variables evaluated in the model are intuitively plausible and statistically significant at the one percent significance level (or 99 percent confidence level), except for POOL_DV, which is significant at the 5 percent significance level (95 percent confidence level). There is a positive relationship between most physical characteristics of the structure (i.e., square footage, lot size, presence of a pool, and quality rating) as expected. In fact, one of the strongest relationships in the model exists with the square footage of the structure (SQFT), which has a coefficient estimate of 66.05 and a corresponding t-statistic of 27.85. The interpretation of the estimate for SQFT is that each additional square foot of house results in a $66.05 increase in the value of that property, holding all else constant; this represents the marginal implicit price of SQFT. Similarly, the marginal implicit price for lot size (LOT_SIZE) is $1,517 per acre; $7,807 for the presence of a pool (POOL_DV); and $17,983 per quality rating score (QUALITY) as determined by the County Assessors office.

One factor that has a negative relationship with property values is the age of the structure at the time of the sale (AGE_SALE); as the age of the structure increases, the value of the property decreases. The marginal implicit price for AGE_SALE is -$322, which represents a $322 reduction in property values per year increase in the age of a house.

The neighborhood variables in the model indicate the relative difference in property values between other communities in the study area and the community of Oroville (the neighborhood variable for Oroville was omitted from the regression equation to avoid perfect collinearity – observations from the Oroville area are included in the model). All of the neighborhood variables, except Palermo (**PALERMO**) and Feather Falls (**FTHFALLS**), are statistically significant at the one percent significance level; **PALERMO** is significant at the 5 percent significance level, whereas **FTHFALLS** is not significant at any reasonable confidence level.[3]

On average, properties located in the communities of Paradise (**PARADISE**), Forbestown (**FORB**), and Palermo (**PALERMO**) have a higher values than properties located in Oroville, holding all else constant. It is estimated that this relative difference in property values is roughly $24,461 in Paradise, $23,652 in Forbestown, and $9,950 in Palermo. The other communities that comprise the study area, namely Concow (**CONCOW**), Berry Creek (**BRYCRK**), and Feather Falls (**FTHFALLS**) have lower property values relative to properties located in Oroville, with the relative difference in values ranging from $11,635 lower in Berry Creek, $18,520 lower in Concow, and $22,824 lower in Feather Falls.

The two economic-based variables in the model, interest rates (**INT_RATE**) and seasonal demand during the months April through August (**APR-AUG**), demonstrate a negative and positive relationship, respectively, with property values. Each of these

_____

[3] The neighborhood variable representing Feather Falls was retained in the model despite not being statistically significant because it is part of the set of neighborhood variables included for analyses.

Oroville Facilities Relicensing   21   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

variables is statistically significant at the one percent significance level. Each percentage increase in the average mortgage interest rate (**INT_RATE**) results in a decrease in property values of approximately $5,810, holding all else constant. Conversely, properties that are sold during the peak home-buying season (April through August), which also represents the peak recreation season at Lake Oroville, are, on average, valued higher than those properties sold in other months, holding all else constant. The marginal implicit price of **APR-AUG**, or the relative difference in sales prices between the April through August period compared with the September through March period, is approximately $9,614.

The trend variable in the model (YEAR), which is represented by the year the home was sold, is positive and statistically significant at the 10 percent significance level. In other words, home prices have trended upward between 1991 and 2002, after accounting for inflation (by adjusting sales prices by the CPI Index). The magnitude of this positive trend is roughly $307 per year, holding all else constant.

The final two variables in the model, which are the key variables of interest for the study and represent the amenity-based characteristics of properties in the study area, are distance to Lake Oroville (**DIST_ORO (log)**) and lake levels associated with the time of the property sale (**LAKE_3AVE**). As expected, there is a negative relationship between distance to Lake Oroville (**DIST_ORO (log)**) and property values. In other words, as the distance between a property and Lake Oroville increases, the lower its value will be, holding all else constant. Conversely, properties that are located closer to the lake are valued higher, on average, than those properties located further away. This can be attributed to relatively better access to recreation opportunities and improved aesthetic quality associated with those properties that are located closer to the lake. The

coefficient estimate for **DIST_ORO (log)** has an associated t-statistic of -6.62 and is statistically significant at the one percent significance level (p-value=0.000). The interpretation for this variable is as follows: a one percent increase in the distance to Lake Oroville (e.g., from 10,000 meters to 10,100 meters) is expected to result in a $44.97 decrease in property values, holding all else constant.

The result for the other key variable of interest, lake levels at Lake Oroville (**LAKE_3AVE**), is not intuitively plausible. This variable is defined as the average monthly lake level over the preceding 3 months from the date of the sale, and is intended to represent average lake-level conditions during the home-buying process. The coefficient estimate for this variable is negative (-125.56) and statistically significant at the one percent significance level (t-statistic = -13.35 and p-value = 0.000). This implies that lower average lake levels near the time of sale are expected to result in higher property values, all else equal. This is counter-intuitive to the expectation that higher lake-levels would positively influence property values based on more accessibility to lake-level dependent recreation facilities and the aesthetic value of a fuller reservoir. Based on the results, interpretation for this variable is as follows: a one foot increase in the average monthly lake levels over the 3-month period preceding the sale is expected to result in a decrease of $125.56 in property values, holding all else constant.

The reason for this counter-intuitive result for the lake-level variable is unknown at this time. Historical lake level and property value data were reviewed to gain further insight into this relationship. A plot of average annual property values and lake levels over the 1991-2002 study period (see Appendix F) depicts this negative relationship. However, there is no "real-world" evidence that suggests that lower lake levels would positively

Oroville Facilities Relicensing   23   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

influence property values, especially based on the characteristics of Lake Oroville where usability of facilities and the appearance of the lake improve with higher lake levels.

It should be noted that extensive effort was made to evaluate possible correlations between lake levels and variables omitted from the model that could have produced these results. Variables that were tested include a trend variable as measured by the year of the sale and other economic variables, including the Dow Jones Industrial Average and an index of San Francisco/Bay Area housing prices. In addition, various functional forms were tested for the lake-level variable, as well as testing various sub-periods of the dataset. Under all circumstances, the lake-level variable remained negative and statistically significant. Ultimately, it was concluded that the results for lake level is likely attributed to some type of spurious correlation with some factor(s) that has not been identified for inclusion in the model.

4.2 Alternative Model Specifications

It should be noted that various model specifications were tested in the development of the preferred model presented above in Section 4.4.1. While it is not possible to include modeling results for all of the model specifications that were tested, it is worthwhile to present a summary of the pertinent results related to recommendations made by the Technical Review Team (TRT) in defining the model. Model output for these alternative model specifications also are presented in Appendix E.

It was suggested that the preferred model should be estimated for each of the community areas separately. These models, therefore, illustrate the effect of the

Oroville Facilities Relicensing   24   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report
Study Plans No. R18 and R19   Property Value Analysis

explanatory variables, including lake-level, on property values for a specific community.

In summary, the overall results for the community models vary, with the best-fitting model occurring in the Forbestown model (adjusted R-squared = .805) and the least-fitting model occurring in the Berry Creek model (adjusted R-square = .497); a separate model could not be estimated for the Feather Falls area due to the lack of observations. In the context of the lake-level effects. The Oroville and Paradise models both produce negative and statistically significant results (one percent significance level) for the lake-level variable, similar to the model presented above that includes all communities in the study area. The lake-level variable in the Concow model is also negative, but statistically significant at the 10 percent significance level. The lake-level variable in the remaining models, Forbestown, Palermo and Berry Creek are negative, but not statistically significant at any reasonable significance level.

In addition, a recommendation was made to estimate a model using only properties that are located on streets that potentially have a view of the reservoir. This suggestion was based on trying to better understand the counter-intuitive results surrounding the lake-level variable (i.e., why higher lake levels are, on average, negatively influencing property values). A total of 88 properties in the sample are located on roadways that potentially provide views of the reservoir based on discussion with local realtors. Overall, the limited sample model is a slightly better-fitting model that the complete model (adjusted R-squared = .796, versus .782). Also, several of the explanatory variables have substantially different coefficients and significance statistics, including the lake-level variable (LAKE_3AVE). In the limited sample model, the coefficient estimate on the lake-level variable is -82.31 (versus -125.56) and the t-statistic is -1.292 (versus -13.568); as a result, the lake-level coefficient is no longer statistically significant

at any reasonable significance level. The interpretation of these results suggest that there is no relationship between higher lake levels and property values for those properties that are likely most affected by the aesthetic value of lake levels.

Finally, it was recommended by the TRT that the regression model include a variable that controls for distance to the community of Chico. It was suggested that the distance-property value relationship in the model was actually capturing the effect of proximity to Chico on property values. The distance from each property in the data set to the approximate center of the Chico area was calculated using GIS. However, when evaluating the correlation statistics for the explanatory variables, this distance variable had a strong correlation with the dummy neighborhood variable corresponding to the community of Paradise (correlation statistic = -0.94). Although the regression results indicated a negative and significant relationship for this variable, it was excluded from the model based on concerns over multicollinearity (note: controlling for this variable did not affect results for the lake-level variable).

5.0 CONCLUSION

The purpose of this study was to evaluate the relationship between the Oroville Facilities and local property values. The analysis focused on two types of relationships: (1) the relationship between proximity (or distance) to Lake Oroville and property values; and (2) the relationship between lake levels at Lake Oroville and property values. The results of the analysis show that distance to Lake Oroville helps explain local property values, with properties closer to the lake being valued higher, all other things being held constant. The results also show that lower lake levels result in higher property values, a finding that is not intuitively plausible based on expectations that higher lake levels provide aesthetic benefits and allow for more access and use of recreation facilities such as boat ramps. However, this negative relationship between lake levels and property values (i.e., lower lake levels result in higher property values) is not statistically significant when evaluating only those properties that potentially have views of the lake.

APPENDIX A

**Hedonic Property-Pricing Model:
Theoretical Basis and Modeling Issues**

THEORETICAL BASIS OF THE HEDONIC PROPERTY-PRICING MODEL

The theoretical model that underlies the hedonic property-pricing model is based on the hedonic price function and a set of assumptions. Let an individual's utility function be written as a function of four sets of goods – the consumption of a composite commodity X (all goods other than housing), a vector of structural characteristics, S, associated with housing (e.g., number of rooms, square footage, lot size), a vector of neighborhood characteristics N in which the property is located (e.g., access to work, crime rates), and finally a vector of location-specific environmental amenities denoted by Q (e.g., air and water quality). Therefore, the utility function of an individual who occupies house *i* can be written as:

$$u = u\,(X, S_i, N_i, Q_i)$$

Assume that the study area can be treated as a single market for housing services. Also assume that consumers have full information on the housing alternatives available and are able to freely select their optimal choice of housing commodity. The final assumption is that the market for housing (property) is in equilibrium.

Under these assumptions, the price of a house (property) can be described as a function of the structural, neighborhood, and environmental attributes of the property location:

Oroville Facilities Relicensing   A-1   January 29, 2004
(FERC) Project No. 2100)   Phase 2 Background Report:
Study Plans No. R18 and R19   Property Value Analysis

$P_i = P_i(S_i, N_i, Q_i)$

where:

P_i = the price of the ith property location.

S_i = a vector of the ith property's structural attributes.

N_i = a vector of the ith property's neighborhood attributes.

Q_i = a vector of the ith property's environmental attributes.

The hedonic price function is derived by maximizing an individual's utility function u (X, S_i, N_i, Q_i), subject to an income constraint given by M - P_i - X = 0, where M is income of the individual and the price of the composite commodity, X, is scaled to \$1. It is assumed that preferences are weakly separable for housing and its characteristics, which allows the demand for these characteristics to be independent from the prices of other goods. Then, the first-order condition for the choice of the jth environmental amenity (q$_j$) is:

$$\frac{\partial u / \partial q_j}{\partial u / \partial X} = \frac{\partial P_i}{\partial q_j}$$

The partial derivative, $\partial P_i / \partial q_j$, is the marginal implicit price of the characteristic q_j. The marginal implicit price for any characteristic is the additional amount that must be paid for an additional unit of that characteristic, all else equal. This first stage analysis reveals the marginal willingness-to-pay for a characteristic, but does not derive the willingness to pay function.

MODELING ISSUES IN ESTIMATING THE HEDONIC

PROPERTY-PRICING MODEL

Market Segmentation

Within any particular region, there may be several separate smaller housing markets. A hedonic pricing model assumes there is a single market within which subject properties are located. The study area for this project is comprised of several communities in the Oroville area and are perceived to be treated as a single market by prospective property owners.

Limited Range of Housing Choices

One problem with using the hedonic pricing model is that it assumes a continuous range of housing choices being available to prospective homeowners. However, in actual markets there is often a limited set of housing options available. With a reasonably large variety of housing options and characteristics associated with those houses, as is the case in this study, there is no issue in estimating the hedonic price function.

Heteroscedasticity

One problem found in many cross-sectional data sets is heteroscedasticity, which occurs when the error variance is not constant across observations. Heteroscedasticity is a direct violation of assumptions in the classical linear regression model. The

Oroville Facilities Relicensing   A-3   January 29, 2004
(FERC) Project No. 2100)   Phase 2 Background Report:
Study Plans No. R18 and R19   Property Value Analysis

consequence of a model with heteroscedasticity is a biased estimate of the variance/covariance matrix, which results in inefficient OLS parameter estimates.

There are several diagnostic tests that are commonly used to test for heteroscedasticity, including the Breusch-Pagan test. The Breusch-Pagan test is fairly flexible in that it does not require the form of heteroscedasticity to be known. Because there is no intuition as to the form of heteroscedasticity in the model, it was used here. The results of the Breusch-Pagan test are detailed in Table A-1 below. The results indicate that there is heteroscedasticity in the model. Due to the presence of heteroscedasticity in the model, the regression results were corrected by using White's heteroscedastic-consistent covariance matrix.

Table A-1: The Breusch-Pagan Test for Heteroscedasticity

Model	B-P Stat	$\chi^2_{critical}$ [1]	Interpretation
Linear	3392.4	24.99 (df = 15)	Reject homoscedasticity (heteroscedasticity)

[1] Chi-squared critical values measured at the 5 percent significance level.

APPENDIX B

**Letter to Local Realtors, Survey Form,
And Survey Results**

May 27, 2003

_____
_____
_____
_____

Dear Mr. / Mrs. _____:

The California Department of Water Resources (DWR) is conducting studies related to the Federal Energy Regulatory Commission's (FERC) Relicensing of hydroelectric and other facilities at the Oroville Facilities (including Lake Oroville, Thermalito Forebay, Thermalito Afterbay, and adjacent lands). These studies are part of the Application for Relicensing that will be submitted to FERC in January, 2005.

One of the studies will evaluate the potential effects of the Oroville Facilities on property values in the surrounding area. As a first step in this study process, we are attempting to identify the geographical area within which property values may be affected by the Oroville Facilities (i.e., "area of influence"). We are contacting a limited number of knowledgeable realtors in Oroville and surrounding areas to help us identify this "area of influence."

We were provided your name by your office as a realtor with knowledge and experience in property transactions in Oroville and/or the surrounding area and who could potentially help us identify this area of influence. We have enclosed a brief survey to which we would like to obtain your responses. We will be contacting you by telephone in the next few days to discuss your responses to these questions or to schedule a more convenient time to contact you. Because the survey is being sent only to a limited number of qualified realtors, your response to our study is essential.

We very much appreciate your assistance in this important study. If you have initial questions about the study or this survey, please call the lead consultant, Thomas Wegge, at (916) 451-3372. You also may contact DWR at (916) 445-6310.

Sincerely,

Douglas Rischbieter
Staff Environmental Scientist

Thomas Wegge
Lead Consultant for Socioeconomic Studies
Harza/EDAW Team

Enclosure

Realtor Survey

1. How many years have you been facilitating property transactions in Oroville and/or the surrounding area?

2. Do you buy and sell primarily residential or commercial properties?

3. Which communities or area(s) do you specialize in?

4. In your opinion, does proximity to the Oroville Facilities, including Lake Oroville, Thermalito Forebay, and Thermalito Afterbay, affect property values in the region?

5. If YES, in which of the following Butte County communities are property values affected by the Oroville Facilities?

__ Bangor	__ Forest Ranch
__ Berry Creek	__ Gridley
__ Biggs	__ Honcut
__ Butte Meadows	__ Jonesville
__ Chico	__ Magalia
__ Clipper Mills	__ Nelson
__ Cohasset	__ Oroville
__ Concow	__ Palermo
__ Dayton	__ Paradise
__ Durham	__ Richvale
__ Feather Falls	__ Stirling City
__ Forbestown	

Realtor	Q1	Q2	Q3	Q4	Bangor	Berry Creek	Biggs	Butte Meadows	Chico	Clipper Mills	Cohasset	Concow	Dayton	Durham	Feather Falls	Forbestown	Forest Ranch	Gridley	Honcut	Jonesville	Magalia	Nelson	Oroville	Palermo	Paradise	Richvale	Stirling City
Bob Beever Bob Beever Realty	31	Res.	w/i 10 mile radius of Oroville	Y		x			x						x	x							x	x			
Gil Davis Country Homes Real Estate	30 (1.5 license)	Both	Yuba City to Chico	Y	x	x						x			x	x			x				x	x	x		
James Guderian Century 21 – Oro Dam	20	Both	Greater Oro. area	Y																			x	x	x		
Mike Heffner Century 21 – Bidwell Realty	1.5	Res.	Oroville	Y								x			x								x		x		
Kristina Hinds Century 21 – Results Realty	3	Res.	Oroville + Paradise	Y (in Oro)		x						x			x	x							x	x			
Mike Johnson United Country Johnson Real Estate	13	Both	Paradise, Magalia (some Oro)	Y		x			x			x			x	x	x	x			x	x	x	x	x		
Julie Miller RE/MAX Altima Realty	12	Res.	Oroville & Paradise	Y		x										x							x	x	x		
Todd Nelson Lake Oroville Realty	7	Res.	East Foothills (Oro, Berry Creek, Forbestown, Feather Falls)	Y	x	x									x	x							x	x			
Rhonda Pineda Housing Helpers	4	Res.	Southside Oroville + Thermalito	Y		x			x	x	x			x	x	x	x	x	x		x	x	x	x	x	x	

Oroville Facilities Relicensing
(FERC) Project No. 2100)
Study Plans No. R18 and R19

B-3

January 29, 2004
Phase 2 Background Report
Property Value Analysis

Realtor	Q1	Q2	Q3	Q4	Bangor	Berry Creek	Biggs	Butte Meadows	Chico	Clipper Mills	Cohasset	Concow	Dayton	Durham	Feather Falls	Forbestown	Forest Ranch	Gridley	Honcut	Jonesville	Magalia	Nelson	Oroville	Palermo	Paradise	Richvale	Stirling City
Rudy Rindlisbacher Mason McDuffie Associated Realty	28	Res.	Greater Oroville area	Y	X	x	x					x		x	x	x							x	x	x		
Marilyn Savage Lake Oroville Realty	11	Res.	Kelly Ridge	Y	X	x									x	x							x	x			
Albert Sprague Help You Sale	2	Res.	Oroville, Berry Creek, Thermalito, Palermo, Feather Falls	Y		x									x	x							x	x	x		
Nona Standfield Coldwell Banker	24	Both	Oroville and outlying areas	Y	x	x	x					x			x	x		x	x			x	x	x		x	
Nona Standfield (2) Coldwell Banker	10	Land	Berry Creek, Bangor	Y	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Nona Standfield (3) Coldwell Banker	12	Both	Oroville	Y	x	x						x			x	x			x			x	x	x		x	
Nona Standfield (4) Coldwell Banker	28	Both	Butte Co. Oroville	Y	x	x				x		x			x	x			x			x	x	x		x	
TOTAL	--	--	--	16	8	14	3	1	4	2	2	10	1	3	13	15	3	4	6	1	3	6	16	15	9	5	1

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

B-4

January 29, 2004
Phase 2 Background Report:
Property Value Analysis

APPENDIX C

ParcelQuest Data Fields

The following data fields are available through the ParcelQuest database:

- A P N
- A/C
- Bathrooms (Full)
- Bathrooms (Half)
- Bedrooms
- Bldg/Liv Area
- Building Class
- Condition
- Construction Type
- Effective Year
- Exterior Wall
- Fireplace
- Foundation
- Frame Type
- Garage Sqft
- Heating
- Improvement Percent
- Improvement Type
- Improvement Value
- Land Value
- Lot Acres
- Lot SqFt
- Multi APN
- Number Of Buildings
- Number Of Units
- Other Imprv
- Other Rooms
- Other Value
- Owner Name
- Parcel Status
- Park Spaces
- Park Type
- Pool Code
- Price/SqFt
- Prop. Addr
- Quality
- Roof Type
- Room Count

- Sale1 Doc Type
- Sale1 Recording Date
- Sale1 Sale Code
- Sale1 Transfer Amt
- Sale2 Doc Type
- Sale2 Recording Date
- Sale2 Sale Code
- Sale2 Transfer Amt
- Sale3 Doc Type
- Sale3 Recording Date
- Sale3 Sale Code
- Sale3 Transfer Amt
- Site Influence
- Situs City
- Situs Zip
- Situs Zip4
- Sprinkler
- Stories
- Style
- Tax Amount
- Tax Rate Area
- Total Value
- Trust Deed 1 Amt
- Trust Deed 1 Code
- Trust Deed 2 Amt
- Trust Deed 2 Code
- Use Code
- Use Description
- Utilities
- Vesting
- Year Built
- Zoning Code

Oroville Facilities Relicensing   C-1   January 29, 2004
(FERC Project No. 2100)   Phase 2 Background Report:
Study Plans No. R18 and R19   Property Value Analysis

APPENDIX D

Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
ADJ_PRICE	5379	25000	696968	7.2E+08	133117.30	69322.054
SQFT	5379	320	5653	8210292	1526.36	557.272
LOT_SIZE	5379	.0310	68.0560	6110.3110	1.135957	3.2920960
POOL_DV	5379	0	1	203	.04	.191
QUALITY	5379	1.50	9.00	31243.50	5.8084	1.05539
AGE_SALE	5379	.5	101.0	158714.0	29.506	20.7353
ORO	5379	0	1	2216	.41	.492
PARADISE	5379	0	1	2816	.52	.499
FORB	5379	0	1	26	.00	.069
CONCOW	5379	0	1	88	.02	.127
PALERMO	5379	0	1	114	.02	.144
BRYCRK	5379	0	1	113	.02	.143
FTHFALLS	5379	0	1	6	.00	.033
INT_RATE	5379	6.03	9.26	39524.06	7.3478	.59340
APR-AUG	5379	0	1	2534	.47	.499
YEAR	5379	1	12	44029	8.19	3.175
DIST_ORO (Log)	5379	4.59	9.91	44819.67	8.3323	.78686
LAKE_3AVE	5379	666.28	892.68	4360361	810.6266	52.52487
Valid N (listwise)	5379					

Oroville Facilities Relicensing   D-1   2/11/2004
(FERC Project No. 2100)   Phase 2 Background Report:
Study Plans No. R18 and R19   Property Value Analysis

APPENDIX E

Model Results

Preferred Model (Not corrected for heteroscedasticity)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.885[a]	.783	.782	32354.946

a. Predictors: (Constant), LAKE_3AVE, BRYCRK, FTHFALLS, FORB, CONCOW, PALERMO, INT_RATE, POOL_DV, AGE_SALE, PARADISE, DIST_ORO (Log), LOT_SIZE, APR-AUG, SQFT, YEAR, QUALITY

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.02E+13	16	1.264E+12	1207.862	.000[a]
	Residual	5.61E+12	5362	1046842522		
	Total	2.58E+13	5378			

a. Predictors: (Constant), LAKE_3AVE, BRYCRK, FTHFALLS, FORB, CONCOW, PALERMO, INT_RATE, POOL_DV, AGE_SALE, PARADISE, DIST_ORO (Log), LOT_SIZE, APR-AUG, SQFT, YEAR, QUALITY

b. Dependent Variable: ADJ_PRICE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	97679.784	12772.110		7.648	.000
	SQFT	66.052	1.174	.531	56.278	.000
	LOT_SIZE	1516.863	146.600	.072	10.347	.000
	POOL_DV	7807.410	2376.938	.021	3.285	.001
	QUALITY	17982.668	761.570	.274	23.613	.000
	AGE_SALE	-322.150	30.164	-.096	-10.680	.000
	PARADISE	24460.693	945.305	.176	25.876	.000
	FORB	23652.494	6416.199	.024	3.686	.000
	CONCOW	-18520.3	3662.623	-.034	-5.057	.000
	PALERMO	9950.052	3217.555	.021	3.092	.002
	BRYCRK	-11634.6	3230.903	-.024	-3.601	.000
	FTHFALLS	-22823.9	13265.542	-.011	-1.721	.085
	INT_RATE	-5809.654	872.136	-.050	-6.661	.000
	APR-AUG	9614.303	987.850	.069	9.733	.000
	YEAR	307.118	165.659	.014	1.854	.064
	DIST_ORO (Log)	-4497.354	613.474	-.051	-7.331	.000
	LAKE_3AVE	-125.561	9.254	-.095	-13.568	.000

a. Dependent Variable: ADJ_PRICE

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

E-1

2/11/2004
Phase 2 Background Report:
Property Value Analysis

Preferred Model (Heteroscedasticity-Consistent Regression Results)

```
Method = HC0

Criterion variable is:
 PRCE_ADJ

Sample size is:
  5379
```

Heteroscedasticity-Consistent Regression Results

	B	S.E.	t	P>|t|
Constant	97679.78	13457.70	7.2583	.0000
YEAR	307.1181	175.4821	1.7501	.0802
SQFT	66.0516	2.3721	27.8456	.0000
LOT_ACRE	1516.863	286.0650	5.3025	.0000
POOL_DV	7807.410	3337.597	2.3392	.0194
QUALITY	17982.67	936.5427	19.2011	.0000
AGE	-322.150	30.3626	-10.6101	.0000
PAR_DV	24460.69	874.6998	27.9647	.0000
FBTWN_DV	23652.49	5512.646	4.2906	.0000
CNCW_DV	-18520.3	4203.944	-4.4055	.0000
PAL_DV	9950.052	4072.834	2.4430	.0146
BRYCK_DV	-11634.6	3707.520	-3.1381	.0017
FTFLS_DV	-22823.9	14941.98	-1.5275	.1267
INT_RATE	-5809.65	913.8501	-6.3573	.0000
DV_APAUG	9614.303	989.3689	9.7176	.0000
L_DST_O1	-4497.35	679.1741	-6.6218	.0000
LK_LEV_6	-125.561	9.4044	-13.3514	.0000

Heteroscedasticity-Consistent Covariance Matrix

	Constant	YEAR	SQFT	LOT_ACRE	POOL_DV	QUALITY	AGE	PAR_DV
Constant	1.81E+08	-1004511	-6564.13	174846.1	4235182	-2112271	-75934.2	299988.7
YEAR	-1004511	30793.98	96.2682	-6143.30	-7393.27	-31507.0	-1059.09	-13219.3
SQFT	-6564.13	96.2682	5.6267	-97.0955	-663.630	-1487.53	-2.5196	-288.629
LOT_ACRE	174846.1	-6143.30	-97.0955	81833.20	-17787.4	36140.69	583.8383	24546.95
POOL_DV	4235182	-7393.27	-663.630	-17787.4	11139550	-154430	-8392.93	306457.2
QUALITY	-2112271	-31507.0	-1487.53	36140.69	-154430	877112.3	13704.76	51064.87
AGE	-75934.2	-1059.09	-2.5196	583.8383	-8392.93	13704.76	921.8903	334.6593
PAR_DV	299988.7	-13219.3	-288.629	24546.95	306457.2	51064.87	334.6593	765099.7
FBTWN_DV	-3495861	18421.24	-67.4590	-168749	218508.7	371562.9	13322.75	312257.1
CNCW_DV	-788095	481.4892	-188.839	-425109	63910.33	96788.79	12483.78	310268.3
PAL_DV	-2698432	2770.136	1091.606	-309220	-298498	89602.15	27465.21	188522.8
BRYCK_DV	-3377696	-707.047	224.3095	-158917	324504.2	223626.3	15104.22	340390.7
FTFLS_DV	-1.1E+07	41620.74	-977.605	-275060	-2144468	374688.8	1541.107	300945.3
INT_RATE	-7579851	79873.84	403.2186	-19907.6	-232551	-47518.6	241.8182	-27861.1
DV_APAUG	3441890	-20087.3	217.4107	-8479.67	-79790.5	-36896.8	895.2947	-21292.7
L_DST_O1	-5022213	10592.60	434.8023	10181.37	-37671.6	9289.589	-653.268	-37222.1
LK_LEV_6	-65350.4	206.7250	-.0831	-259.252	-619.184	-879.506	-20.8018	34.4673

Oroville Facilities Relicensing   E-2   2/11/2004
(FERC Project No. 2100)   Phase 2 Background Report:
Study Plans No. R18 and R19   Property Value Analysis

Heteroscedasticity-Consistent Covariance Matrix (Cont.)

```
          FBTWN_DV   CNCW_DV    PAL_DV  BRYCK_DV  FTFLS_DV  INT_RATE  DV_APAUG  L_DST_O1
Constant -3495861   -788095  -2698432 -3377696  -1.1E+07 -7579851   3441890  -5022213
YEAR      18421.24  481.4892  2770.136 -707.047  41620.74 79873.84 -20087.3  10592.60
SQFT      -67.4590  -188.839  1091.606 224.3095  -977.605 403.2186  217.4107  434.8023
LOT_ACRE   -168749   -425109   -309220  -158917   -275060 -19907.6 -8479.67  10181.37
POOL_DV   218508.7  63910.33  -298498  324504.2 -2144468  -232551 -79790.5  -37671.6
QUALITY   371562.9  96788.79  89602.15 223626.3  374688.8 -47518.6 -36896.8  9289.589
AGE       13322.75  12483.78  27465.21 15104.22  1541.107 241.8182  895.2947  -653.268
PAR_DV    312257.1  310268.3  188522.8 340390.7  300945.3 -27861.1 -21292.7  -37222.1
FBTWN_DV  30389266   1476829   1507778  1036709  976344.7 35689.89  150599.3  26904.22
CNCW_DV    1476829  17673145   2276818  1200698   2107299 39138.48  37297.80  -90558.3
PAL_DV     1507778   2276818  16587974  1489409   1253270 252826.3  285869.6   -315800
BRYCK_DV   1036709   1200698   1489409 13745702   1040662 -30903.9  28652.12  112276.2
FTFLS_DV  976344.7   2107299   1253270  1040662  2.23E+08 590751.7  288799.8  441191.6
INT_RATE  35689.89  39138.48  252826.3 -30903.9  590751.7 835122.0 -99615.2  63596.04
DV_APAUG  150599.3  37297.80  285869.6 28652.12  288799.8 -99615.2  978850.8  19345.36
L_DST_O1  26904.22  -90558.3   -315800 112276.2  441191.6 63596.04  19345.36  461277.4
LK_LEV_6  142.1022  562.8547  266.1826 363.7337  1923.075  10.8155  -4042.54  -46.6809
```

```
          LK_LEV_6
Constant -65350.4
YEAR      206.7250
SQFT       -.0831
LOT_ACRE -259.252
POOL_DV  -619.184
QUALITY  -879.506
AGE       -20.8018
PAR_DV    34.4673
FBTWN_DV 142.1022
CNCW_DV  562.8547
PAL_DV   266.1826
BRYCK_DV 363.7337
FTFLS_DV 1923.075
INT_RATE  10.8155
DV_APAUG -4042.54
L_DST_O1 -46.6809
LK_LEV_6  88.4418
```

Single-Community Preferred Model: *Oroville*

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.880[a]	.775	.774	27471.747

a. Predictors: (Constant), LAKE_3AVE, QUALITY, LOT_SIZE, INT_RATE, POOL_DV, APR-AUG, DIST_ORO (Log), YEAR, AGE_SALE, SQFT

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.73E+12	10	5.732E+11	759.533	.000[a]
	Residual	1.66E+12	2205	754696890.9		
	Total	7.40E+12	2215			

a. Predictors: (Constant), LAKE_3AVE, QUALITY, LOT_SIZE, INT_RATE, POOL_DV, APR-AUG, DIST_ORO (Log), YEAR, AGE_SALE, SQFT

b. Dependent Variable: ADJ_PRICE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	118163.1	16732.963		7.062	.000
	SQFT	53.010	1.591	.494	33.323	.000
	LOT_SIZE	2464.295	198.394	.130	12.421	.000
	POOL_DV	10165.492	2938.388	.036	3.460	.001
	QUALITY	16913.041	1069.895	.283	15.808	.000
	AGE_SALE	-274.324	33.112	-.112	-8.285	.000
	INT_RATE	-5291.709	1161.149	-.053	-4.557	.000
	APR-AUG	6488.847	1316.434	.056	4.929	.000
	YEAR	200.074	222.201	.011	.900	.368
	DIST_ORO (Log)	-7355.243	697.345	-.121	-10.547	.000
	LAKE_3AVE	-96.201	12.484	-.087	-7.706	.000

a. Dependent Variable: ADJ_PRICE

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

E-4

2/11/2004
Phase 2 Background Report:
Property Value Analysis

Single-Community Preferred Model: *Paradise*

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.884[a]	.782	.781	33806.530

a. Predictors: (Constant), LAKE_3AVE, YEAR, LOT_SIZE, DIST_ORO (Log), POOL_DV, QUALITY, APR-AUG, INT_RATE, SQFT, AGE_SALE

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.15E+13	10	1.151E+12	1006.797	.000[a]
	Residual	3.21E+12	2805	1142881437		
	Total	1.47E+13	2815			

a. Predictors: (Constant), LAKE_3AVE, YEAR, LOT_SIZE, DIST_ORO (Log), POOL_DV, QUALITY, APR-AUG, INT_RATE, SQFT, AGE_SALE

b. Dependent Variable: ADJ_PRICE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	147017.0	19684.388		7.469	.000
	SQFT	74.034	1.731	.575	42.759	.000
	LOT_SIZE	1702.460	497.576	.031	3.422	.001
	POOL_DV	8711.896	3621.305	.022	2.406	.016
	QUALITY	17520.883	1142.655	.262	15.333	.000
	AGE_SALE	-468.830	55.565	-.117	-8.438	.000
	INT_RATE	-6857.847	1244.518	-.057	-5.510	.000
	APR-AUG	13465.102	1419.951	.093	9.483	.000
	YEAR	468.000	237.795	.021	1.968	.049
	DIST_ORO (Log)	-4227.034	1096.090	-.035	-3.856	.000
	LAKE_3AVE	-161.087	13.220	-.118	-12.185	.000

a. Dependent Variable: ADJ_PRICE

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

E-5

2/11/2004
Phase 2 Background Report:
Property Value Analysis

Single-Community Preferred Model: *Forbestown*

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.936[a]	.875	.805	27039.194

a. Predictors: (Constant), LAKE_3AVE, DIST_ORO (Log), YEAR, QUALITY, INT_RATE, APR-AUG, LOT_SIZE, SQFT, AGE_SALE

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.21E+10	9	9120433905	12.475	.000[a]
	Residual	1.17E+10	16	731118009.0		
	Total	9.38E+10	25			

a. Predictors: (Constant), LAKE_3AVE, DIST_ORO (Log), YEAR, QUALITY, INT_RATE, APR-AUG, LOT_SIZE, SQFT, AGE_SALE

b. Dependent Variable: ADJ_PRICE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-198173	226040.2		-.877	.394
	SQFT	73.772	23.249	.600	3.173	.006
	LOT_SIZE	-570.655	2324.155	-.032	-.246	.809
	QUALITY	25009.373	9725.035	.639	2.572	.020
	AGE_SALE	850.181	694.941	.244	1.223	.239
	INT_RATE	15297.643	11385.552	.154	1.344	.198
	APR-AUG	25081.040	16663.628	.199	1.505	.152
	YEAR	3210.751	2699.335	.155	1.189	.252
	DIST_ORO (Log)	-733.045	20788.892	-.004	-.035	.972
	LAKE_3AVE	-79.293	123.118	-.076	-.644	.529

a. Dependent Variable: ADJ_PRICE

Oroville Facilities Relicensing   E-6   2/11/2004
(FERC Project No. 2100)   Phase 2 Background Report:
Study Plans No. R18 and R19   Property Value Analysis

Single-Community Preferred Model: *Concow*

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.787[a]	.619	.570	35363.247

a. Predictors: (Constant), LAKE_3AVE, SQFT, LOT_SIZE, DIST_ORO (Log), POOL_DV, YEAR, AGE_SALE, APR-AUG, INT_RATE, QUALITY

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.57E+11	10	1.568E+10	12.537	.000[a]
	Residual	9.63E+10	77	1250559252		
	Total	2.53E+11	87			

a. Predictors: (Constant), LAKE_3AVE, SQFT, LOT_SIZE, DIST_ORO (Log), POOL_DV, YEAR, AGE_SALE, APR-AUG, INT_RATE, QUALITY

b. Dependent Variable: ADJ_PRICE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	43590.857	120090.7		.363	.718
	SQFT	42.679	8.618	.467	4.952	.000
	LOT_SIZE	1185.122	350.009	.258	3.386	.001
	POOL_DV	9661.632	22402.665	.033	.431	.667
	QUALITY	25887.497	6734.262	.392	3.844	.000
	AGE_SALE	-165.721	484.819	-.031	-.342	.733
	INT_RATE	-4210.955	8469.581	-.041	-.497	.620
	APR-AUG	-2612.181	8559.415	-.024	-.305	.761
	YEAR	1173.916	1470.440	.069	.798	.427
	DIST_ORO (Log)	2217.161	4526.151	.037	.490	.626
	LAKE_3AVE	-172.248	92.673	-.152	-1.859	.067

a. Dependent Variable: ADJ_PRICE

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

E-7

2/11/2004
Phase 2 Background Report:
Property Value Analysis

Single-Community Preferred Model: *Palermo*

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.859[a]	.738	.713	37025.898

a. Predictors: (Constant), LAKE_3AVE, QUALITY, YEAR, POOL_DV, DIST_ORO (Log), LOT_SIZE, APR-AUG, INT_RATE, SQFT, AGE_SALE

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.98E+11	10	3.980E+10	29.028	.000[a]
	Residual	1.41E+11	103	1370917090		
	Total	5.39E+11	113			

a. Predictors: (Constant), LAKE_3AVE, QUALITY, YEAR, POOL_DV, DIST_ORO (Log), LOT_SIZE, APR-AUG, INT_RATE, SQFT, AGE_SALE

b. Dependent Variable: ADJ_PRICE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	264790.1	188587.0		1.404	.163
	SQFT	98.262	8.771	.779	11.203	.000
	LOT_SIZE	1329.577	739.965	.100	1.797	.075
	POOL_DV	-3044.661	18127.001	-.009	-.168	.867
	QUALITY	8370.343	5444.188	.131	1.537	.127
	AGE_SALE	82.887	206.618	.029	.401	.689
	INT_RATE	7491.214	7313.060	.062	1.024	.308
	APR-AUG	-14464.4	8466.342	-.102	-1.708	.091
	YEAR	1520.516	1311.009	.069	1.160	.249
	DIST_ORO (Log)	-35702.1	18270.312	-.105	-1.954	.053
	LAKE_3AVE	-89.692	77.581	-.069	-1.156	.250

a. Dependent Variable: ADJ_PRICE

Single-Community Preferred Model: *Berry Creek*

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.736[a]	.542	.497	35113.257

a. Predictors: (Constant), LAKE_3AVE, YEAR, SQFT, AGE_SALE, DIST_ORO (Log), APR-AUG, POOL_DV, LOT_SIZE, QUALITY, INT_RATE

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.49E+11	10	1.490E+10	12.085	.000[a]
	Residual	1.26E+11	102	1232940842		
	Total	2.75E+11	112			

a. Predictors: (Constant), LAKE_3AVE, YEAR, SQFT, AGE_SALE, DIST_ORO (Log), APR-AUG, POOL_DV, LOT_SIZE, QUALITY, INT_RATE

b. Dependent Variable: ADJ_PRICE

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	135284.4	121040.0		1.118	.266
	SQFT	64.957	10.063	.574	6.455	.000
	LOT_SIZE	661.413	427.554	.122	1.547	.125
	POOL_DV	-35856.4	27355.324	-.096	-1.311	.193
	QUALITY	8307.274	5095.978	.156	1.630	.106
	AGE_SALE	346.443	291.446	.099	1.189	.237
	INT_RATE	-8120.415	8295.771	-.094	-.979	.330
	APR-AUG	9246.456	7354.141	.093	1.257	.212
	YEAR	-1344.661	1396.053	-.087	-.963	.338
	DIST_ORO (Log)	-9964.045	5338.549	-.144	-1.866	.065
	LAKE_3AVE	-41.161	67.164	-.045	-.613	.541

a. Dependent Variable: ADJ_PRICE

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

E-9

2/11/2004
Phase 2 Background Report:
Property Value Analysis

Single-Community Preferred Model: *Feather Falls*

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1.000[a]	1.000	1.000	.

a. Predictors: (Constant), LAKE_3AVE, LOT_SIZE, SQFT, DIST_ORO (Log), INT_RATE

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.73E+10	5	5466048909	.	.[a]
	Residual	.000	0	.		
	Total	2.73E+10	5			

a. Predictors: (Constant), LAKE_3AVE, LOT_SIZE, SQFT, DIST_ORO (Log), INT_RATE

b. Dependent Variable: ADJ_PRICE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	997967.2	.000		.	.
	SQFT	-5.668	.000	-.077	.	.
	LOT_SIZE	-15715.9	.000	-.462	.	.
	INT_RATE	194862.9	.000	1.518	.	.
	DIST_ORO (Log)	-89822.4	.000	-.570	.	.
	LAKE_3AVE	-1837.069	.000	-1.475	.	.

a. Dependent Variable: ADJ_PRICE

Note: The model tolerance level was reach based on the small sample size; statistical results are not fully available

LIMITED SAMPLE MODEL: PROPERTIES THAT POTENTIALLY HAVE LAKE VIEWS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.905[a]	.820	.796	29159.852

a. Predictors: (Constant), LAKE_3AVE, QUALITY, INT_RATE, AGE_SALE, LOT_SIZE, APR-AUG, DIST_ORO (Log), YEAR, SQFT, BRYCRK

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.98E+11	10	2.975E+10	34.992	.000[a]
	Residual	6.55E+10	77	850296963.3		
	Total	3.63E+11	87			

a. Predictors: (Constant), LAKE_3AVE, QUALITY, INT_RATE, AGE_SALE, LOT_SIZE, APR-AUG, DIST_ORO (Log), YEAR, SQFT, BRYCRK

b. Dependent Variable: ADJ_PRICE

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-143353	84861.116		-1.689	.095
	SQFT	53.432	6.834	.528	7.818	.000
	LOT_SIZE	14727.683	6670.759	.241	2.208	.030
	QUALITY	31780.982	6433.076	.361	4.940	.000
	AGE_SALE	-1897.398	631.316	-.181	-3.005	.004
	BRYCRK	-83042.9	39371.114	-.235	-2.109	.038
	INT_RATE	-2647.517	6342.785	-.024	-.417	.678
	APR-AUG	5939.481	6975.794	.046	.851	.397
	YEAR	1855.915	1352.383	.087	1.372	.174
	DIST_ORO (Log)	16075.413	7640.623	.119	2.104	.039
	LAKE_3AVE	-82.309	63.728	-.067	-1.292	.200

a. Dependent Variable: ADJ_PRICE

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

E-11

2/11/2004
Phase 2 Background Report:
Property Value Analysis

APPENDIX F

Lake Level vs. Property Level Graph

Lake Level vs. Property Values

Oroville Facilities Relicensing
(FERC Project No. 2100)
Study Plans No. R18 and R19

F-1

2/11/2004
Phase 2 Background Report:
Property Value Analysis